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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/781,706	02/20/2004	Chandra Mouli	M4065.0986/P986	4202

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EXAMINER	
VU, HUNG K	
ART UNIT	PAPER NUMBER
2811	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/781,706	MOULI, CHANDRA	
	Examiner	Art Unit	
	Hung Vu	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 January 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36 and 49-51* is/are pending in the application.

4a) Of the above claim(s) *4,5,12,13,17-19,21,25,35,36 and 49-51* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,6-11,14-16,20,22-24 and 26-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Request for Continued Examination

1 A request for continued examination (RCE) under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicants' submission filed on 10/09/01 has been entered. An action on the RCE follows.

Election/Restrictions

2. Newly submitted claims 49-51 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Claims 49-51 are not belong to the elected embodiment.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 49-51 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection

is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-3, 6-11, 14-16, 20, 22-24, 26-33 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-6, 12, 14-16, 18 and 36-40 of U.S. Patent No. 7,154,136. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1-3, 6-11, 14-16, 20, 22-24, 26-33 are generic to claims 1-6, 12, 14-16, 18 and 36-40 of U.S. Patent No. 7,154,136. The claimed invention (claims 1-3, 6-11, 14-16, 20, 22-24, 26-33) of the present application is a mere broader version of the claimed invention (claims 1-6, 12, 14-16, 18 and 36-40) of the above identified U.S. Patent with similar intended scope, thus allowing unjustified or improper timewise extension of the "right to exclude" granted by a U.S. Patent No. 7,154,136.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 6, 7, 11, 14-16, 20, 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshinori (JP 63-9968, of record).

Yoshinori discloses, as shown in Figures 1-7 (especially Figure 6), an image sensor comprising:

a substrate (2) formed over a base layer (1);

a plurality of pixel cells formed within the substrate, each pixel cell comprising a photo-conversion device;

a plurality of trenches, each trench being provided along a perimeter of a respective pixel cell, each trench extending at least to a surface of the base layer, each trench having sidewalls, and being at least partially filled with a material (11) that inhibits electrons from passing through the trench.

Regarding claim 2, Yoshinori discloses the sensor further comprising a dielectric material (10) formed along at least a portion of the sidewalls.

Regarding claim 3, Yoshinori discloses the dielectric material is an oxide.

Regarding claims 6 and 20, Yoshinori discloses the material is a conductive material.

Regarding claim 7, Yoshinori discloses the conductive material comprises one of doped polysilicon, undoped polysilicon and boron-doped carbon.

Regarding claims 11 and 24, Yoshinori discloses the sensor comprises a CCD image sensor.

Regarding claim 14, Yoshinori discloses, as shown in Figures 1-7 (especially Figure 6), a structure for isolating an active area on a semiconductor device, the structure comprising:

a trench formed in a substrate (2) along at least a portion of a periphery of the active area in the semiconductor device, wherein the trench extends at least to a surface of a base layer (1) below the substrate, and wherein the trench has sidewalls;

a dielectric liner (10) formed along the sidewalls;

a material (11) formed over the dielectric liner that at least partially fills the trench and inhibits electrons from passing through the trench.

Regarding claim 15, Yoshinori discloses the dielectric liner comprises an oxide material.

Regarding claim 16, the term "high-density plasma oxide and spin-on dielectric oxide" is method recitation in a device claimed. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is

unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 26-29 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshinori (JP 363009968, of record).

Yoshinori discloses, as shown in Figures 1-7 (especially Figure 6), a processing system comprising:

a semiconductor device;

a trench formed in a substrate (2) along at least a portion of a periphery of the active area in the semiconductor device, wherein the trench extends at least to a surface of a base layer (1) below the substrate, and wherein the trench has sidewalls;

a dielectric liner (10) formed along the sidewalls;

a material (11) formed over the dielectric liner that at least partially fills the trench and inhibits electrons from passing through the trench.

Yoshinori does not disclose the processing system comprising a processor. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the processing system of Yoshinori comprising a processor since it is conventional and

commonly used a processor to control the operating of the system..

Regarding claim 27, Yoshinori discloses the dielectric material is an oxide.

Regarding claim 28, the term "high-density plasma oxide and spin-on dielectric oxide" is method recitation in a device claimed. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Regarding claim 29, Yoshinori discloses the material comprises one of doped polysilicon, undoped polysilicon and boron-doped carbon.

Regarding claim 33, Yoshinori discloses the sensor comprises a CCD image sensor.

6. Claims 8, 9, 22, 23, 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshinori (JP 363009968, of record) in view of Clevenger et al. (US 2004/0227061, of record).

Regarding claims 8, 22 and 30, Yoshinori discloses the claimed invention including the sensor as explained in the rejection above. Yoshinori does not disclose the trench has a depth greater than

about 2000 Angstroms. However, Clevenger et al. discloses an image sensor comprising a trench (116A,116B) having a depth greater than about 2000 Angstroms. Note Figure 1-13 and section [0036] of Clevenger et al.. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the trench of Yoshinori having the depth, such as taught by Clevenger et al. in order to have the desired depth to prevent the electrons from passing through the trench.

Regarding claims 9, 23 and 31, Yoshinori and Clevenger et al. disclose the claimed invention including the sensor as explained in the rejection above. Yoshinori and Clevenger et al. do not disclose the depth of the trench in the range of about 4000 to about 5000 Angstroms. Although Yoshinori and Clevenger et al. do not teach the depth of the trench, as that claimed by Applicants, however, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form the trench of Yoshinori and Clevenger et al. having a desired depth, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 10 and 32, Yoshinori discloses the claimed invention including the sensor as explained in the rejection above. Yoshinori does not disclose the semiconductor device comprises a CMOS image sensor. However, Clevenger et al. discloses a semiconductor device comprising a CMOS image sensor. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the device of Yoshinori comprising

CMOS image sensor, such as taught by Clevenger et al. in order to have the desired circuit's configuration.

Response to Arguments

7. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Vu whose telephone number is (571) 272-1666. The examiner can normally be reached on Monday to Thursday 6:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard T. Elms can be reached on (571) 272 - 1869. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Vu

April 12, 2007

Hung Vu

Primary Examiner